

Amendments to the Claims

This listing of claims will replace all prior version and listings of claims in the Application for patent.

1-37. (Canceled)

38. (Withdrawn; Currently Amended) A method of manufacturing a durable fibre reinforced cement product, said method comprising steps of:

mixing a web fibre reinforced cement formulation;

forming from said formulation a green product defining first and second generally opposing major surfaces;

curing the green product to form a cured product; and

applying a cross-linked, radiation-curable carbonation reducing sealer to said first and second major surfaces, wherein the sealer has an overall thickness of at least 15 microns, wherein the sealer and the cement product interact with one another to form an inter-penetrating network extending into the first and second surfaces of the cement product thereby reducing differential carbonation and controlling carbonation gradients in the cement product.

39. (Canceled)

40. (Withdrawn) A method according to Claim 38, wherein the carbonation reducing sealer applied to at least one of said first and second major surfaces is a radiation curable sealer.

41. (Canceled)

42. (Canceled)

43. (Withdrawn) A method according to Claim 38 wherein the sealer applied to at least one of said first and second major surfaces is selected from the group comprising: acrylics; epoxy, acrylates, and urethane acrylate sealers.

44. (Withdrawn) A method according to Claim 38, wherein the sealer applied to at least one of said first and second major surfaces includes an integral adhesion promoting composition.

45. (Canceled)

46. (Canceled)

47. (Withdrawn) A method according to Claim 38, wherein the curing step is performed using a process selected from the group comprising: autoclave, air and steam curing.
48. (Withdrawn) A method according Claim 38, wherein the product is a sheet product configured for use as an exterior cladding panel.
49. (Canceled)
50. (Withdrawn) A method according to Claim 50, wherein the first major surface of the sheet product is a mounting surface adapted for inward orientation toward a substrate and the second major surface of the sheet product is an exposed surface adapted for outward orientation.
51. (Withdrawn) A method according to Claim 50, wherein the substrate is a supporting frame.
52. (Withdrawn) A method according to Claim 38, wherein one or more of the chemical composition of the formulation, method of manufacture, and physical structure of the cured product, are selected to reduce propensity for carbonation in the product.
53. (Withdrawn) A method according to Claim 52, including the further step of compressing said green product prior to curing in a controlled manner such that the cured product exhibits a reduced carbonation gradient.
54. (Withdrawn) A method according to Claim 50, wherein the cured product has a porosity of between 30% and around 60%.
55. (Canceled)
56. (Withdrawn) A method according to Claim 50, wherein the cured product has a relative density of between 0.5 and around 2.0.
57. (Canceled)
58. (Withdrawn) A method according to Claim 50, wherein said wet fibre reinforced cement formulation has a cement to silica ratio of between 0.2 and around 1.5 on a dry weight basis.
59. (Canceled)
60. (Canceled)
61. (Canceled)
62. (Canceled)
63. (Canceled)
64. (Canceled)

65. (Withdrawn) A method according to Claim 38, wherein the carbonation reducing sealer is applied in multiple stages or coats.

66. (Canceled)

67. (Canceled)

68. (Canceled)

69. (Withdrawn) A method according to Claim 38, wherein the carbonation reducing sealer applied to at least one of the major surfaces is cured in multiple stages.

70. (Withdrawn; Previously Presented) A method according to Claim 38, including the further step of applying a keycoat over the sealer following partial curing and prior to full curing, to enhance bonding between the sealer and the keycoat.

71. (Withdrawn; Previously Presented) A method according to Claim 38, including the further step of applying a topcoat over the sealer following partial curing and prior to full curing, to enhance bonding between the sealer and the topcoat.

72-75. (Canceled)

76. (Currently Amended) An engineered fibre reinforced cement product including
a fiber reinforced cement board having a first major surface and a second generally opposing major surface, and

a cross-linked, radiation-curable carbonation reducing sealer applied to at least the first and second major surfaces, the sealer applied to at least the first and second major surfaces having an overall thickness of at least 15 microns, wherein the cement board and the sealer applied to at least the first and second major surfaces interact with one another to form an inter-penetrating network extending into the surface of the cement board to thereby reducing differential carbonation and controlling carbonation gradients in the cement board.

77. (Previously Presented) The product according to claim 76, wherein the carbonation reducing sealer applied to each major surface is between 15 microns to around 50 microns in overall thickness.

78. (Previously Presented) The product according to claim 76, wherein the carbonation reducing sealer is applied to substantially all surfaces of the product.

79. (Previously Presented) The product according to claim 76, wherein the carbonation reducing sealer on at least one of the major surfaces is a radiation curable sealer.

80. (Previously Presented) The product according to claim 76, wherein the carbonation reducing sealer on at least one of the major surfaces is curable by a form of radiation selected from the group consisting of UV, infrared, near infrared, RF, microwave, gamma, and electron beam radiation.

81. (Previously Presented) The product according to claim 76, wherein the carbonation reducing sealer on at least one of the major surfaces is thermally, air or chemically curable.

82. (Currently Amended) The product according to claim 76, wherein the carbonation reducing sealer applied to at least the first and second major surfaces is composed substantially of a formulation selected from the group consisting of acrylics, epoxy acrylate, and urethane acrylate sealer.

83. (Currently Amended) The product according to claim 76, wherein the carbonation reducing sealer applied to at least the first and second major surfaces includes an integral adhesion promoting formulation.

84. (Previously Presented) The product according to claim 76, wherein the carbonation reducing sealer applied to each major surface is composed of substantially the same formulation.

85. (Previously Presented) The product according to claim 76, wherein the carbonation reducing sealer applied to said first and second major surfaces are composed of substantially different formulations.

86. (Currently Amended) The product according to claim 76, wherein the carbonation reducing sealer applied to at least the first and second major surfaces includes an adhesive formulation adapted to enhance bonding of a topcoat.

87. (Previously Presented) The product according to claim 76, wherein the carbonation reducing sealer on at least one of the major surfaces is covered by a separate keycoat adapted to enhance bonding of a topcoat.

88. (Previously Presented) The product according to claim 76, wherein the carbonation reducing sealer on at least one of the major surfaces is applied in multiple coats or stages.

89. (Previously Presented) The product according to claim 76, wherein the carbonation reducing sealer on at least one of the major surfaces is cured in multiple stages.

90. (Previously Presented) The product according to claim 76, wherein a keycoat is applied over the carbonation reducing sealer on at least one of the major surfaces following partial curing and prior to full curing, to enhance bonding between the carbonation reducing sealer and the keycoat.

91. (Previously Presented) The product according to claim 76, wherein a topcoat is applied over the carbonation reducing sealer on at least one of the major surfaces following partial curing and prior to full curing, to enhance bonding between the sealer and the topcoat.

92. (Currently Amended) The product according to claim 76, wherein the carbonation reducing sealer applied to at least the first and second major surfaces is substantially alkali resistant.

93. (Currently Amended) The product according to claim 76, wherein the carbonation reducing sealer applied to at least the first and second major surfaces is sufficiently cross-linked to impede migration of carbon dioxide through the sealer to a predetermined extent.

94. (Currently Amended) The product according to claim 76, wherein the carbonation reducing sealer applied to at least the first and second major surfaces is substantially flexible in a cured state.

95. (Currently Amended) The product according to claim 76, wherein one or more of the sealer applied to at least the first and second major surfaces and physical structure of the engineered fibre reinforced cement ~~a cured~~ product when cured are selected to reduce propensity for carbonation in the engineered fibre reinforced cement product.

96. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product has a cement to silica ratio between 0.2 to around 1.5 on a dry weight basis.

97. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product has a cement to silica ratio between 0.3 to around 0.9 on a dry weight basis.

98. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product has a cement to silica ratio is between 0.3 to around 0.5 on a dry weight basis.

99. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product has a cement to silica ratio between 0.36 to around 0.43 on a dry weight basis.
100. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product has a cement to silica ratio around 0.39 on a dry weight basis.
101. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product has a porosity of between 30% to around 40%.
102. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product has a porosity of between 30% to around 60%.
103. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product has a porosity of between 35% to around 45%.
104. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product has a relative density of between 0.5 to around 2.0
105. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product has a relative density of between 0.8 to around 1.9.
106. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product is formed using a Hatschek process.
107. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product is formed by extrusion.
108. (Previously Presented) The product according to claim 76, wherein the engineered fibre reinforced cement product is a sheet configured for use as an exterior cladding panel.
109. (Previously Presented) The product according to claim 108, wherein the sheet is substantially rectangular in shape and wherein the carbonation reducing sealer is applied to all sides.
110. (Previously Presented) The product according to claim 108, wherein a first major surface of the sheet is a mounting surface adapted for inward orientation toward a substrate and a second major surface of the sheet is an exposed surface adapted for outward orientation.

111. (Previously Presented) An engineered fibre reinforced cement product including
a first major surface with a reduced propensity to differential carbonation,
wherein the product has a cement to silica ratio of between 0.29 to around 0.51 and a
porosity of between 25% to around 45%, wherein differential carbonation is reduced by
application of a carbonation reducing sealer and a keycoat.
112. (Previously Presented) The product according to claim 111, wherein the keycoat is
applied onto the carbonation reducing sealer before the sealer is fully cured.
113. (Previously Presented) The product according to claim 111, wherein the carbonation
reducing sealer is applied to substantially all surfaces of the product.
114. (Previously Presented) The product according to claim 113, wherein the carbonation
reducing sealer is a radiation curable sealer.